AMENDMENTS TO THE DRAWINGS

The attached sheet of drawings includes changes to Fig. 1. This sheet, replaces the original sheet. The reference numeral 27 has been added to the electrophotographic device box to be consistent with the specification.

Support for the drawing correction can be found, for example, at paragraph 17 of applicants' corresponding published patent application U.S. Pat. Pub. No. 2005-0212902 A1.

No new matter has been added.

Attachments: Replacement Sheet and Annotated Sheet Showing Changes

Remarks:

In the present paper, Claims 1-28 are pending. Claims 20-28 have been withdrawn from consideration. Claims 1, 11, 14 and 19 have been amended. Support for the amendments to the claims can be found, for example, at paragraphs as 8, 17, 24, 26, 28, etc., well as Figs. 1 and 4 of the applicants' corresponding published patent application U.S. Pat. Pub. No. 2005-0212902 A1.

Further, the specification has been amended herein to incorporate application serial numbers of applications that were incorporated by reference in the specification, where the serial number of the incorporated reference was unknown at the time of filing this application. No new matter was added.

35 U.S.C. § 102(e)

Claims 1, 11 and 14 stand rejected under 35 U.S.C. § 102(e) as being unpatentable over U.S. Pat. No. 7,079,685 to Hirota et al. (hereinafter Hirota). According to the M.P.E.P. §706.02, in order to be anticipating under §102, the reference must teach every aspect of the claimed invention. *Carella v. Starlight Archery and Pro Line Co.*, 804 F.2d 135, 138, 231 U.S.P.Q. 644, 646 (Fed. Cir. 1986).

Contrary to the Examiner's position, Hirota does not teach or suggest, as claimed and clarified in the amendments herein:

> an optical scanner *for installation into* an electrophotographic device comprising ... a laser ...laser optics arranged to sweep the laser beam along a non-ideal laser beam scan path...and scanner circuitry comprising a first interface operatively configured to communicate with a controller in a corresponding electrophotographic device *to which the optical scanner is installed* and a memory device having stored thereon, data that characterizes the laser beam scan path, wherein the data is communicated to the controller through the first interface *after installation* of the optical scanner in the corresponding electrophotographic device such that electronic compensation of the laser beam scan path is performed by the electrophotographic device during imaging operations based upon the data.

The optical scanner (referred to as the LD head or printhead) disclosed in Hirota, which is illustrated in Fig. 2 and is shown in Fig. 1 as an unlabeled box that includes a polygon mirror 301[1], is only described in general and with reference to unlabeled laser diodes and a polygon mirror 301[2]. There is no teaching or suggestion in Hirota of the LD printhead having an interface or a memory as claimed.

In support of the rejection, the Examiner attempts to read the claimed "...scanner circuitry (of an optical scanner) comprising a first interface... and a memory device..." onto the "element 205" disclosed by Hirota. Contrary to the Examiner's conclusion, it is the applicants' position that, when reading claim 1 as a whole, Hirota can not teach or suggest this claim element. For example, Hirota teaches a copier that includes an image reading section and an image forming section. A document to be copied is placed on a glass platen of the image reading section and is illuminated by an exposure lamp. A CCD sensor 204 collects the light from the exposure lamp and outputs R,G,B data corresponding to the document on the glass platen. The "element 205" cited by the Examiner is an "image processing circuit" that processes the R,G,B data from the sensor to convert the analog sensor output into a digital image. That image is sent to an image former 300 for subsequent processing and imaging[3]. Thus, the relied upon "image processing circuitry 205" *is not* part of the optical scanner (LD Head) disclosed in Hirota at all, and thus cannot provide an interface or a memory of an optical scanner (LD printhead).

Moreover, the Examiner apparently, attempts to read the claimed "...first interface..." onto an unspecified interface in Hirota that transmits data from the print image controller to the print head controller[4]. Still further, the Examiner attempts to read the claimed "...memory device having stored thereon, data that characterizes said laser beam scan path, wherein said data is communicated to said controller through said first interface ..." onto a memory device that is provided as part of an "image distortion corrector"[5].

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[1] See for example, Hirota, Col. 4, lines 8-18.
[2] See for example, Hirota, Col. 4, starting at line 62-Col. 5, line 7.
[3] See for example, Hirota Col. 3, lines 45-67; Col. 5, lines 8-19.
[4] See for example, Office action mailed August 21, 2006, page 2.
[5] See for example, Office action mailed August 21, 2006, top of page 3.

Contrary to the Examiner's conclusion, it is the applicants' position that Hirota can not teach or suggest these claim elements. For example, the relied upon print image controller and printhead controller are electronics controller components of the copier itself, and are not interfaces of the *optical scanner* (printhead or LD head) as the Examiner attempts to argue. In particular, the "image distortion corrector" is part of the print image controller that performs image corrections and outputs data to the printhead controller[6]. Moreover, as will be seen, neither the print image controller nor the printhead controller in Hirota perform any compensations based upon data stored in a memory device on the printhead.

In Hirota, the "print image controller" (shown in Fig. 6) performs corrections to the image data to correct for image color shift errors[7] (before the image data is communicated to the printhead controller). However, compensation data is not derived from information stored in a memory on the LD printhead. As noted more fully herein, there is *no disclosed memory device* on the LD printhead. Moreover, compensation *is not* based upon data that characterizes laser beam scan path. Rather, to determine the required image data corrections, test pattern data for the CYMK toners are generated by a test data generator 530. These patterns are simultaneously transferred onto a paper feeding belt 304 of the imaging section. The amount of color shift of the CYM components relative to the K component are detected by three resist detecting sensors 312, which is located proximate to the paper feeding belt 304 downstream of the imaging stations. A drawing position controller 510 and an image distortion corrector 540 (of the print image controller) correct the image data in accordance with the results of the color shift detection[8].

As correctly noted by the Examiner, the image distortion corrector 540 includes a memory device. In particular, that memory device stores data as to a number of lines corresponding to the maximum width of the distortion including bow and skew detected in the test pattern image applied to the paper feeding belt 304 in the subscanning direction. The corrector 540 also stores a flip flop circuit that stores data as to the number of dots corresponding to the maximum width of the distortion in the main scan magnification distortion parameter[9].

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[6] See for example, Hirota, Col. 26, lines 54-57.
[7] See for example, Hirota, Col. 8, lines 1-3.
[8] See for example, Hirota, Col. 8, starting at line 27.
[9] See for example, Hirota, Col. 26, starting at line 51.

However, as noted above, neither the image distortion corrector 540, nor its corresponding memory, form any part of the optical scanner (LD head). In fact, as seen in Fig. 6, these components are utilized before the image data even reaches the printhead controller.

Thus, it can be seen that Hirota does not teach or suggest a memory or an interface on the optical scanner (LD head). Moreover, it would not make any sense to provide a memory on the LD printhead that comprises "... data that characterizes the laser beam scan path ..." because in Hirota, the image compensation data values used by the print image controller correspond to actual measurements of applied toner on the paper feeding belt, and not data that characterizes laser beam scan path. Moreover, in Hirota, correction values *cannot* be generated until *after* the LD head is installed into the copier because the correction is based upon a toner image applied to the paper feeding belt.

The Examiner further references the memory of the drawing position controller 510. However, as can be seen in Fig. 6 of Hirota, the drawing position controller 510 is just another part of the print image controller that feeds the print head controller. The memory of the drawing position controller 510 is not part of the optical scanner (LD head)[10].

As noted in greater detail above, Hirota does not teach or suggest an optical scanner that comprises a first interface and a memory device as noted in greater detail above. As such, the applicants further assert that claims 11, 14 and 19 are patentable over Hirota for reasons analogous to that set out for Claim 1 in greater detail herein.

In view of the clarifying amendments and comments herein, the applicants respectfully request that the Examiner withdraw the rejection to claims 1, 11, 14 and 19, and the claims that depend therefrom under 35 U.S.C. §102(c).

35 U.S.C. § 103

According to the M.P.E.P. §706.02(j), to establish a *prima facie* case of obviousness, the prior art reference must teach or suggest all the claim limitations. It is the applicants' position

[10] See for example, Hirota, Col. 25. lines 1-50; Fig. 6.

that a *prima facie* case of obviousness has not been established for any of the dependent claims because the cited references, even when combined, fail to teach or suggest each of the elements of the base claim from which these claims depend.

Hirota is discussed in detail above.

Claim 2 stands rejected under 35 U.S.C. §103 as being unpatentable over Hirota in view of U.S. Patent No. 6,747,766 to Kamisuwa et al. (hereinafter, Kamisuwa). Kamisuwa fails to teach or suggest an interface and memory of an optical scanner, such as a printhead. Rather, in Kamisuwa, image compensation is measured by using a color reader (CCD with multiple sensors) to measure pixels in an output of the apparatus. Therefore, the applicants respectfully request that the Examiner withdraw the rejection of claim 2.

Claim 3 stands rejected under 35 U.S.C. §103 as being unpatentable over Hirota and Kamisuwa and further in view of U.S. Pat. No. 6,342,963 to Yoshino (hereinafter, Yoshino) or U.S. Pat.Pub. No. 2002/0130792 to Schaefer (hereinafter, Schaefer).

Yoshino fails to teach or suggest an interface or a memory provided on an optical scanner (scanning apparatus 30), as best seen in Fig. 3[11]. Rather, in Yoshino, the SOS/EOS sensors (sub-scanning position detection sensor and main scanning position detection sensor) identified by the Examiner are coupled to an external modulation controller of the apparatus[12]. Schaefer also fails to teach or suggest an interface or a memory provided on an optical scanner as claimed. Schaefer does not even teach or suggest an optical scanner for an electrophotographic device. Rather, Schaefer relates to real-time detection of obstacles, such as long distance communication wires and power wires, for low flying airborne vehicles[13]. Therefore, the applicants respectfully request that the Examiner withdraw the rejection of claim 3.

[11] See for example, Yoshino, starting at Col. 7, line 60.
[12] See for example, Yoshino, starting at Col. 12, line 45.
[13] See for example, Schaefer, paragraph 0002.

Claim 4 stands rejected under 35 U.S.C. §103 as being unpatentable over Hirota and Kamisuwa and Yoshino or Schaefer, in further view of U.S. Pat. No. 4,975,626 to Yagi et al. (hereinafter, Yagi). Yagi fails to teach or suggest an interface or a memory provided on an optical scanner as claimed. Yagi teaches a polygon mirror motor controller that corrects periodic errors in scanning speed of a polygon mirror. As the passage relied upon by Examiner points out, the motor controller compares a pulse signal generated by the scanner motor with a reference clock signal. The motor speed is controlled based upon a phase deviation between the pulse signal and the reference clock signal[14]. Yagi is completely silent to the arrangement of a corresponding printhead. Therefore, the applicants respectfully request that the Examiner withdraw the rejection of claim 4.

Claims 4 and 5 stand rejected under 35 U.S.C. §103 as being unpatentable over Hirota and Kamisuwa and Yoshino or Schaefer, in further view of U.S. Pat. No. 4,932,732 to Nakajima (hereinafter, Nakajima). As the Examiner points out, Nakajima recognizes that the scan velocity of a laser beam causes non-uniformity of pixel placement. Further, the exposure level becomes non-uniform. Nakajima further discloses that such non-uniformities may be corrected by altering the scanning pixel clock frequency and light emission depending upon scan line position. However, there is no teaching or suggestion of providing an interface or memory on the optical scanner (optical scanning apparatus 21, which is best seen in Fig. 4). Therefore, the applicants respectfully request that the Examiner withdraw the rejection of claims 4 and 5.

Claim 6 stands rejected under 35 U.S.C. §103 as being unpatentable over Hirota and Kamisuwa and Schaefer, in further view of U.S. Pat. No. 4,602,383 to Ogawa et al. (hereinafter, Ogawa). Ogawa teaches an image data compression system for use in facsimile machines that encodes grayscale image data[15]. Ogawa does not teach or suggest an interface or a memory provided on an optical scanner as claimed. Therefore, the applicants respectfully request that the Examiner withdraw the rejection of claim 6.

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[14] See for example, Yagi. Col. 3, starting at line 60 through Col. 4, line 37.
[15] See for example. Ogawa, Col. 1, lines 5-8.

Claim 7 stands rejected under 35 U.S.C. §103 as being unpatentable over Hirota and Kamisuwa, in further view of U.S. Pat. No. 5,933,184 to Ishigami et al. (hereinafter, Ishigami). In Ishigami, velocity correction data is measured and stored for each facet of the polygon mirror 6. There is no teaching or suggestion of a memory device on an optical scanner that stores data that characterized laser beam scan path, laser beam optical power, or operational parameters, such as temperature, power on cycles, etc. Therefore, the applicants respectfully request that the Examiner withdraw the rejection of claim 7.

Claim 8 stands rejected under 35 U.S.C. §103 as being unpatentable over Hirota and Kamisuwa and Schaefer, in further view of U.S. Pat. No. 4,233,612 to Hirayama et al. (hereinafter, Hirayama). Hirayama teaches systems for focusing a beam. Therefore, the applicants respectfully request that the Examiner withdraw the rejection of claim 8.

Claim 9 stands rejected under 35 U.S.C. §103 as being unpatentable over Hirota in further view of U.S. Pat. No. 6,486,906 to Foster et al. (hereinafter, Foster). Foster fails to teach or suggest an interface or a memory provided on an optical scanner. Therefore, the applicants respectfully request that the Examiner withdraw the rejection of claim 9.

Claim 10 stands rejected under 35 U.S.C. §103 as being unpatentable over Hirota in further view of U.S. Pat. No. 6,697,401 to Schrodinger (hereinafter, Schrodinger). Schrodinger teaches a digital controller for a laser driver. However, Schrodinger fails to teach or suggest an interface or a memory provided on an optical scanner. Moreover, as taught in Schrodinger, the second interface is a "conditional interface" in that the user cannot directly access the interface. Rather, the user access must go through the user interface 5 for all interaction. The "second interface" is utilized and controlled by the control unit 2[16]. Therefore, Schrodinger fails to teach or suggest "...first and second interfaces configured such that the electrophotographic device communicates memory data with the memory device using the first interface and the electrophotographic device communicates image data to be printed to the laser using the second interface" as claimed. Accordingly, the applicants respectfully request that the Examiner withdraw the rejection of claim 10.

[16] See for example, Shrodinger, Col. 3, lines 1-10.

Claim 12 stands rejected under 35 U.S.C. §103 as being unpatentable over Hirota in further view of U.S. Pat. No. 6,657,650 to Olmelchenko et al. (hereinafter, Olmelchenko) or U.S. Pat. No. 6,175,375 to Able et al. (hereinafter, Able) or U.S. Pat. No. 3,575,505 to Parmigiani (hereinafter, Parmiagani). Olmelchenko, Able and Parmingiani each fail to teach or suggest an interface or a memory provided on an optical scanner. Therefore, the applicants respectfully request that the Examiner withdraw the rejection of claim 12.

Claim 13 stands rejected under 35 U.S.C. §103 as being unpatentable over Hirota in further view of U.S. Pat. No. 5,491,540 to Hirst (hereinafter, Hirst) or U.S. Pat. No. 5,272,503 to LeSueur et al. (hereinafter, LeSueur). There is no teaching or suggestion of a memory device on an optical scanner that stores data that characterized laser beam scan path, laser beam optical power, or operational parameters, such as temperature, power on cycles, etc., in either LeSueur or Hirst. Therefore, the applicants respectfully request that the Examiner withdraw the rejection of claim 13.

Claim 15, 17 and 18 stands rejected under 35 U.S.C. §103 as being unpatentable over Hirota in further view of U.S. Pat. No. 5,754,576 to Kusano et al. (hereinafter, Kusano). Kusano fails to teach or suggest an interface or a memory provided on an optical scanner. Therefore, the applicants respectfully request that the Examiner withdraw the rejection of claims 15, 17 and 18.

Claim 16 stands rejected under 35 U.S.C. §103 as being unpatentable over Hirota in further view of U.S. Pat. No. 5,061,949 to Ogino et al. (hereinafter, Onigo) or U.S. Pat. No. 6,408,013 to Akagi et al. (hereinafter, Akagi). Ogino and Akagi each fail to teach or suggest an interface or a memory provided on an optical scanner. Therefore, the applicants respectfully request that the Examiner withdraw the rejection of claim 16.

Claim 19 stands rejected under 35 U.S.C. §103 as being unpatentable over Hirota in further view of 6,363,228 to Ream et al. (hereinafter, Ream). Ream fails to teach or suggest an interface or a memory provided on an optical scanner. Therefore, the applicants respectfully request that the Examiner withdraw the rejection of claim 19.

Conclusion

For all of the above reasons, the applicants respectfully submit that the above claims recite allowable subject matter. The Examiner is encouraged to contact the undersigned to resolve efficiently any formal matters or to discuss any aspects of the application or of this response. Otherwise, early notification of allowable subject matter is respectfully solicited.

Respectfully submitted,
Stevens & Showalter, L.L.P.

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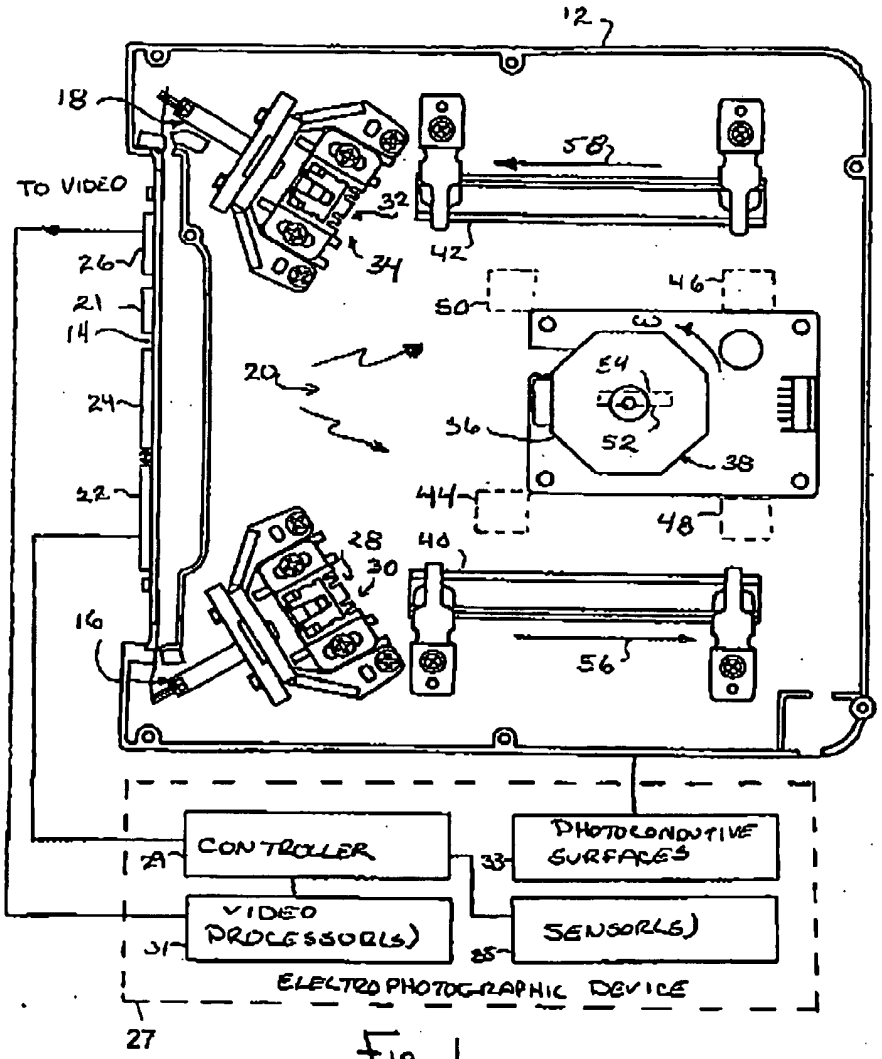
ANNOTATED DRAWING SHEET SHOWING CHANGES



Added Reference Number

Fig. 1